[001]Device for Coding, Transmitting and/or Receiving Signals

[002]

[003] Description

[004] The invention concerns a device for the coding, transmitting and/or the receiving of non-verbal. that is, emotionally generated signals.

[005]

[006] Telecommunication devices are normally so designed, that they serve for the transmission of information, wherein that information, as a rule, consists if a verbal communication or on the other hand, a communication by text. Text, in this matter, can be forwarded in appropriate codes, so that the message from the sender, upon receipt, can be translated into a readable, verbal form. Already known is a classic use of telecommunication apparatuses, wherein persons, spatially separated from one another, can communicate between one another by clearly designated happenings, namely, for one, the selection of a telephone number of the respective receiving person (hereinafter, the "addressee). This said classic use serves for the transmission of telemetric data and, if required, also biometric data through communication apparatuses, in order that, in central computer stations, corresponding analysis, diagnoses, or even business proposals can be processed. In the case of signal transmissions of this type, as a rule, only existing conditions, such as, for example, the presence of a definite temperature, or pulse-rate, or again if required EKG-data can be sent to a central computer, which then enables the broadcast of the thereto connected message and if necessary, furnishes a printout or screen-image of a decoded message.

[007] The known telecommunication apparatuses, by means of which spatially separated persons can come into mutually understandable contact with one another, are, up to this time, limited to verbal exchange or the transmission of text-related information.

[008]

[009] The invention directs itself, to the purpose of enabling non-verbal sharing of feelings, such as, for example, passion or anger, this sharing being independent of concrete objects, such as biometric data. It is the intent of the invention, that in this manner, a spatially distanced person can make a specific, person-related exchange of information. The invention undertakes the further purpose, to allow the making of a

device for this said purpose which is of small dimensions and simple in its construction, so that, with a minimum of conventional, and predetermined codes an appropriate transmission of nonverbal communication, attended with the least possible number of misunderstandings, can take place.

[010] For the achievement of this purpose, the invented device exists essentially therein, in that the non-verbal, that is to say, the emotional signals from one input-unit, which, at least incorporates one sensor for the capture of an allusion, of a pressure or a deformation, which characteristic can be received, measured, and finally disseminated over a communications network, namely a radio broadcasting system. These circumstances enable, that the addressee possesses a receiving-unit which transposes the said sent signal into an understandable visual and/or acoustic and/or a mechanically perceptible form.

[011] Thereby, the non-verbal, that is to say, the emotionally engendered signal of an input device has been: (1) made available, (2) transmitted to a receiving unit, and (3) formulated in an appropriate manner for actual interpretation. Further, the said input unit grasps not only codes of relatively difficult formulation of various conditions of the mind, but actually can accept a simple and unmistakable, non-verbal input. This being true, then what is to be achieved is the possibility that the receiving side of such a system can be essentially improved.

[012] Thereby, since, as already explained, the input device incorporates at least one sensor for the capture of an allusion, a pressure or a deformation, it is possible that non-verbal communication such as stroking, pressing or pinching can be input in a simple manner wherein the coding is not difficult to master and the said communication be transmitted over a conventional communication network after said coding. This having been done, now the addressee can possess a receiving device, wherein the transmitted signal is converted to one or more visual, acoustic or mechanical forms, – for example, the said form could be a vibration, perceptual to the said addressee. Accordingly, it is now possible to make a current pressure or stroking motion on the sensor of an input device understandable upon receipt, in an appropriate said visual, acoustic or mechanical manner. To express this in other words, the point is, to do away with verbalization and instead, reduce and confine a communication to given limits, not only for the sender, but also for the addressee. In this way, it becomes possible, besides conventional verbal communication, along with all its tendencies for misunderstandings, to open a second path of communication, and do so by a relatively simple input device. This allows the potential to be at hand, wherein with full understanding and possibly with

a specific purpose, to simulate and transmit emotional states, wherein a reproduction thereof is fully possible and independent of actual, biometrically, measurable values.

[013] In a particularly simple manner, the invented knowledge for this action is developed to the extent, that the input device, possesses sensors and/or buttons for touching, pressing, optics, or shaking. Such contacting mode sensors or pressure sensors are to be housed in a specially designed, small package, for example, the size being based on sensors integrated on a chip, wherein all of the components of the input device can be compacted into the smallest possible space and the generation of a plurality of non-verbal signals is still permitted. .

[014] In an advantageous manner, and especially in regard to the ability of capturing signals such as, for example, stroking, the design of the said device is so conceived, that the input apparatus possesses a touching, i.e., a pressure sensitive surface, upon which a sensor array is arranged, whereby a multiplicity of touching, i.e. pressure points are individually accessible. Consequently, the input device can be designed in the manner of track pads, which are used in laptop computers, so that even stroking motions can be picked up from the sensor and transmitted. The receiving element could, for instance, be a moving light which corresponds to the said stroking movement.

[015] In order to achieve the most realistic reproduction of stroking movements, not only the spatial displacement of the points representing touching and pressure is to be measured on the appropriate surface, but also the magnitude of the pressure exerted. In this way, the input device can possess a quantified, input signal, with which the exercised touching pressure can be particularly well detected and evaluated on the appointed touching-pressure sensitive surface. On the part of the expression of the received signal, the translation of different touching pressures, for example, can be carried out by variations in the color and/or the intensity of light or by judging the degree of sound level accompanying an acoustic signal.

[016] In accord with another advantageous embodiment, the touching-pressure sensitive surface can be transparent or translucent, so that under the said surface, for example, display apparatuses, such as lights or LEDs of different colors can be arranged. When this is done, then the input device can be simultaneously operated as a transmitting device and optionally, the touching-pressure surface can perform as an input means or the display apparatus under the transparent surface of said input device can act as a producer of an image or data statement. In this way, an instantaneous, bidirectional communication between two partners, each with a combination input and receiving device becomes possible.

[017] In order to assure, generally, that a corresponding signal is being accurately imparted to a receiving device, wherein the motions or signals at the input end have been correctly captured, and that the sent statement is essentially proportional and measured, then, advantageously, the design must be so conceived, that the receiving device is equipped with display means, for the presentation of various colors and has heat sensitive surfaces and has vibration generators. Preferentially, a display element is developed to the extent, that it is particularly well designed for the presentation of various colors and different light intensities. In this way the characteristics of color transmission and the intensity of light can be adjusted in accord with decoded signals of the sensors for touching or pressure or deformation. Under these circumstances, as alteration of the contact points on the appropriate sensitive surfaces activates, respectively, changes in colors, touching-pressure values and intensity of light. Thereby, a broad, direct and easily comprehended transmission of non-verbal and/or emotional signals is achieved, so that the acceptance of said signals by a receiving apparatus can be further amplified in quality.

[018] A better comprehension and communication of emotional signals, such as, for example, stroking over a touch-sensitive surface is obtained in that, as an advantageous development of the invented device, the display array possesses a plurality of separately controllable, and varied colored areas which are respectively activated upon the touching of a correspondingly selected area of the touch-sensitive surface. Because of this design, a device, possessing both input and receiving capabilities, possesses areas of assigned activities, which, in a simple manner, are marked by the arrangement of the display apparatus underneath a transparent touching surface and, in that area, can be congruently arranged.

[019] In order to be able to carry out the capture of deformations, especially regarding the secure input of such signals as stroking, love and acquiescence, as well as pinching, the invented design was so conceived, that the input device possesses a deformable cushion, which advantageously, is composed of and is encapsulated within a flexible or elastic touching surface, presenting the following: an optical sensor, especially a photo-resistance element, and a plurality of optically refracting glass beads, these latter being, in particular, spherical and which are positionally changeable by pressure on their contact surface. Especially in the case of this last advantageous design of the cushion, wherein, glass spheres, particularly small glass beads, are encapsulated under a flexible, touchable surface, it becomes possible to execute corresponding kneading, pinching, pressing or even stroking of the said touching

surface, so distorting this bead filled cushion, that by the reaction of supplied optical sensors, each in accord with an external light condition, different signals can be generated. If the touching surface, for example, is covered by the hand during a high ambient light condition, then this leads to a correspondingly greatly reduced value at the photocell of the optical sensor. When this occurs, by means of a relative sliding of optically refractive filled bodies (the said glass beads) then the color impressions can be correspondingly varied, as these are individually optically sensed.

[020] In order, now, to be able to employ an apparatus of the described kind, even during a low value of ambient light and using optical sensors for the generation of corresponding signals, advantageously, the design is so conceived, that the deformable cushion can possess light sources, namely LEDs with a flexible or elastic contact surface. In this case, the light emitted by the integrated light sources, by means of corresponding dislocation of bodies or spheres of the cushion filling, can release different signals to optical sensors. The amplitude of this auxiliary light, in its relation to the ambient light can, in this case, be compensated for by the input device, the latter making a correct balance by means of a potentiometer. It follows that the existence of such light sources as the said LEDs, when the operating situation includes various sources of light with various emitted light colors, is advantageous, not only for the input device, but also for a receiving device. The input device can, thus be constructed essentially in the same manner as the receiving device. In that case, where pressure sensors are concerned, care must be taken, that a corresponding thrust motion or another optical presentation can be displayed, which provides information directly relating to sender-side applied pressure movements. Such pressure movements are not only visually and mechanically detectable in the form of axial displacements, but exhibit themselves, obviously, in the screen of a display, for example by the imaging of different colored high lights, which clearly represent the pressure points on which the pressure was originally exerted.

[021] A true, reality imaging can be advantageously achieved, if the receiving device is likewise designed as a cushion, the shape and/or the color representation of which can be changed by surface manipulation, thus exhibiting incoming decoded transmitted signals of pressure or deformation sensors. Such a design permits, that the input device and the receiving device can be built from essentially the same components.

[022] The touching surface can be designed to be either transparent or translucent, whereby this, especially when LEDs of various colors are included, offers the possibility, to even visualize a combination of colors, insofar as the receiving device is

simultaneously capable of both sending and receiving. For this purpose the design is so conceived, that the light sources are arranged with different lights within the cushion, which are individually capable of being controlled, that is, turned on and off.

[023] The transmission of corresponding signals taken from the input device can be made in such a simple manner, that the coded signals can be sent as tones or tone successions. The coded tone signals, however, can also be digitalized and transmitted in digitalized form.

[024] Because of the employed components, the device can be constructed as a small package, whereby the weight of its weight must conform to the ergonomics of hand movement of and allow corresponding manipulations, such as stroking, pressing, pinching or activation of certain buttons. The device can be separately constructed independently of actual telecommunication equipment and subsequently can be electrically connected thereto in an appropriate manner. For such a connection, besides a cable linkage, naturally a radio connection for short distances is applicable, as this is set forth according to the "Bluetooth" standard. Again, an infrared connection is possible. The invented apparatus is thus, advantageously so designed, that the input unit can serve separately with telecommunication equipment. This is especially true where mobile telephones are concerned.

[025] The invented device, when equipped with basic components, can be provided to serve the following functions:

Contact sensors	Illuminated surfaces
Nutrition sensors	Lighting
Pressure sensors	Flash lighting
Deformation sensors	Probers
Temperature sensors	Switches
Loud speakers	Etc.

Advantageously, as an addition, an electrical interface is provided, by means of which, the invented device can communicate with additional sensors or devices, with further application possibilities and be connected with additional receiving modules. The object of the present invention is thus an appropriate input module having a sensor as well as a corresponding receiving module, which latter respectively possesses an electrical interface for communication with the said input module. Naturally, it is possible to provide a combination input/receiving module with a common electrical interface. The input/receiving module serves for the equipping of a basic apparatus for extended functions, which increase the value of the said basic apparatus.

[026]

[027] The invention, in the following, will be more fully detailed and explained with the aid of a drawing of a schematically illustrated embodiments. Accordingly, attached is Fig. 1, which shows a first embodiment and Fig. 2 demonstrates a second embodiment of the invented device.

[028]

[029]

[030]

[031] In Fig. 1, one embodiment of the invented device is shown in a top view. The device is designed in a three lobe construction for stable support on a suitable base or for interconnection with telecommunication apparatus. In the lobes, can be installed, an energy source 1, a vibrator 2 and other components. Upon the use of two vibrators 2, it is possible to design a corresponding circuit arrangement or even a rotation of the entire device 3 about a central axis. In this case, the respective vibrators 2 should be allowed a certain freedom of movement in the direction of the double arrow 4, in order to be able to create a two-axis motion in a rotational movement.

[032] The device 3 contains, besides a control logic, which is not further explained, and which is placed in the lobes or in the midsection and also contains a switch 5 for the On/Off switching of the device and a free programmable button 6, with which certain functions can be transmitted. Schematically indicated are also potentiometers 7 and 8, with which a corresponding calibration and especially an appropriate tuning as to the ambient light is made possible.

[033] The central component of the design shown in the present embodiment is a middle-located cushion 9 with a pressure button 10. The cushion is covered by a membrane, which itself is transparent and in this way, light emitting elements which reside under the said membrane can be recognized, by their intensity and color. As to items 11, 12 and 13, these are schematically presented light diodes (LED's) of different color values. These light diodes, 11, 12 and 13 can be separated, one from the other, so that, in this way, the incidence of light thereon and especially the range of the color can be controlled.

[034] The centrally located button 10 can be pressed in an essentially axial direction, whereby this movement can be undertaken by a rod 14. The rod 14, itself, can be bound again with a drive. If the rod 14 is placed on the receiver side, then the drive can

activate the rod 14 in an axial direction, so that a mechanical visualization of a pressure exercised on the sender side permits itself to be realized. Additionally situated in the given embodiment is a flash tube 15, with which exceptional effects may be carried out.

[035] Underneath the transparent, i.e. translucent touch-sensitive membrane it is possible that corresponding glass spheres or beads can be placed as filling, which, by a disturbance of the covering membrane can be displaced. In each case, in accord with how many of the light diodes 11, 12 or 13 have been activated, that is to say, in accordance with how high the ambient external light intensity is in the immediate environment of the device 3, from the photo sensors 16 a different light impression is made evident, which can be correspondingly coded. The optical sensors 16 permit, under these circumstances, stroke motions or even a pinch to be detected and correspondingly transmitted. Further, in addition to the optical impressions which can be obtained from the photocells, i.e. the optical sensors 16, naturally, also the translation-motion on the buttons 10 also stand as sensor signals.

[036] Fig. 2 presents a varied embodiment of the device, wherein the previously described deformable cushion is omitted and predominately, touching sensors as well as optical signals are used for the transmission of emotional content. The apparatus 3 possesses an outer shape, which, with ergonometric considerations, favor a one-hand operation and which shape is comparable to a computer mouse. It is further a switch 5 for the on/off switching of the device and a freely programmable button 6 is provided, with which certain functions can be undertaken. The central element of the device 3 is an essentially circular touch or pressure sensitive surface 17 for the capture of movements such as stroking. The surface, that is the sensor 17, captures physical touching by means of pressure, deformation, or electrical signals which change themselves. Such signals, for example, can be obtained from arrays which can be designated: resistance-network, capacitive, hall sensor, or photo-cell. With an evaluation electronic circuit for a sensor of this kind, it is possible to determine the position of the emitting disturbance within the limits of the touch or pressure sensitive surface 17 as well as the quantitative size of the exercised disturbance. The touch or pressure sensitive surface 17 is designed to be transparent, so that the signals from below the display apparatus under the said surface, such as are emitted from LCD's or LEDs, are visible. The surface 17, that is, the display apparatus, encompasses a multitude of areas 18, whereby each area of the display apparatus can be controlled alone and independently. This permits the illumination of the area in varied, different colors. The design in this case, can be so conceived, that each area 18 of the touch or

pressure sensitive surface 17 has a corresponding area 18 of the display apparatus dedicated thereto. Further, that area, which was touched at the sender is illuminated at the receiver. Thereby, it is permitted, that those stroke movements executed by the stroke movements of the first communication partner become correspondingly visible to a second communications partner.

[037] In addition to the above, a button 19 with an integrated flash can be seen, whereby an activation of said button 19 by the sender releases, as a result, a flash at the receiver. Additionally, activation buttons 20, 21, 22 which serve for the transmission of special effects. Finally, a loud speaker 23 is provided, which, dependent on a sender-side activation of the button 24, 25 or 26 can emit various acoustic signals.

[038] If the device 3, by means of the connection 27 becomes contacted to a telephone line, such as, for example, a mobile phone, then, by means of the loud speaker 23, naturally, the verbal communication by means of the telephone network will be received and acoustically repeated by the said loud speaker 23.

[039] The reference number 28 designates an interface, by means of which additional modules can be connected to the device 3.

[040] As a whole, with such a small constructed device of this kind, a plurality of possibilities of emotional inputs and a multiplicity of possible signals, with which such emotional input, to a great extent, can be signalized, without the danger that to achieve this advantage, instruction manuals are needed which are difficult to understand.